Acoustic LAB No. 5768-0001

INSTRUCTIONS FOR

DC OUTPUT ADAPTER

MODEL 2300

PLEASE RETURN TO LIBRARIAN
ORG. 6-7744 M.S. 27-14
manual # 1
ING ACOUSTICS LABORATORY

BALLANTINE LABORATORIES, INC.

Boonton, New Jersey

MP MASTER
MA32000

PLEASE RETURN TO LIBRARIAN
ORG. 6-7744 M.S. 27-14
manual # I

BALLANTINE DC OUTPUT ADAPTER

MODEL 2300

1. Specifications (when used with Ballantine Model 300 Voltmeter)

DC Output Range Corresponding to F.S.D. of Associated Model 300 Voltmeter
.....8 ma to 1.8 ma

Adjustable DC Source Resistance Range
.....8000 ohms to 18000 ohms

Max Internal Emf (DC) for above conditions
.....15 volts

Max Linearity departure at 10% of max DC output.....15 uamps

Frequency Response Variation:
100 cps to 100kc.....1db total
40 cps to 150kc.....2db total

Type of Rectification
.....Full-wave, average responding

Connections
Input.....Standard Telephone Tip and Sleeve Plug
Output.....Standard 3/4" Spaced, Hollow Binding Posts

Dimensions.....2" x 2" x 6-1/4" Overall Length

Weight.....1 pound

12/17/53

2. Description & Application

The Model 2300 DC Output Adapter is designed to plug into the AC output jack of the Ballantine Model 300 Electronic Voltmeter (or similar Voltmeter) so as to provide a dc output to drive external strip-chart recorders, remote meters or any device required up to 2 milliamperes D.C. for normal operation. Such loads will then respond uniformly to millivolt AC signals applied to the voltmeter input over a frequency range of 40 cps to 150 kc. Higher signal levels (up to 100 v AC) may be accommodated merely by appropriate operation of the voltmeter range switch, while for voltages above 100 v and not exceeding 10 kv standard Ballantine multipliers are available.

The Adapter is a passive device comprising a broad-band 1:1 isolation transformer feeding a germanium diode rectifier bridge (see schematic herein) which is connected to the output binding-posts via a current controlling rheostat. The purpose of this component, the shaft of which is accessible, is to provide the user with a convenient means of adjusting the dc output so as to correlate with a definite value of the AC input potential to the voltmeter associated with the Adapter. Thus, for example, it may be required that when the voltmeter reads full scale prior to inserting the Adapter the latter shall deliver 1 milliamp to the external dc load. The ADJ DC OUT control can then be set so as to accommodate any value of the load resistance in the range 0-7000 ohms.

No damage can be caused to the Adapter by accidental overloading of the associated Model 300 Voltmeter which is designed to saturate at a safe level to protect its own meter circuit.

The output binding posts of the Adapter are floating, but either the positive or negative terminal may be grounded without significant detriment to the operation of the device.

3. Operating Instructions

3.1 The microphone plug fitted on the Adapter is of sufficient strength to permit insertion in a vertical as well as horizontal panel.

3.2 When the Adapter is used with a Ballantine Model 300 Voltmeter it is essential that the AC OUTPUT CONTROL of the latter is rotated to its extreme clockwise position at all times if the specifications of the Adapter are to be fully realized.

3.3 Connection to the external load may be made with unshielded twisted pair, since adequate suppression of the AC signal occurs in the Adapter.

3.4 The maximum available dc output from the Adapter may be computed approximately using the following formula:

$$I = \frac{1500V}{8000 \pm R}$$

where:

I = dc output (ma) when the ADJ DC OUT control is at its clockwise extreme

V = Deflection in volts on the AC VOLTS scale of the associated Model 300 when the Adapter is removed. (This does not refer to the actual signal input to the voltmeter since the range switch factor is not considered)

R = Resistance in ohms of dc load

The minimum value to which the output current may be reduced by setting the ADJ DC OUT control to the counter-clockwise extreme is obtained by using 18,000 instead of 8,000 as the constant term in the

denominator of the above expression. Lower values of current may be attained for a given value of V by adding external resistance in series with the dc load, but such an artifice will result in appreciable non-linearity of the dc output with respect to the ac signal voltage.

3.5 A condition of operation giving optimum flatness of frequency response exists when 1 milliamp dc output is produced in correlation with full scale deflection of the associated Model 300 Voltmeter. In these circumstances load resistances ranging from 0 to 7000 ohms may be accommodated without recourse to additional external resistance.

. Service and Maintenance

Since the Adapter is a simple, tubeless, rugged device few defects or faults are likely to be experienced with it. However, in order to insure that any repairs which may become necessary will not result in deterioration of performance it is recommended that a defective Adapter be returned to allantine Laboratories for repair. Prompt attention to the trouble and a reasonable charge for its correction are assured.

. Warranty

We warrant each instrument sold by us to be free from defects in material and workmanship. Our obligation under this warranty is limited to repairing or replacing any instrument or part thereof, except tubes and batteries, which shall within 1 year after shipment to the original purchaser prove upon our examination to be defective.